

Chayanov revisited: A model for the economics of complex kin units

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Chayanov's model of the peasant economy is based on autarkic nuclear family households. Expansion to the more complex households and kin groups common in peasant societies shows that the sharp changes Chayanov observed in the consumer/producer ratio over the domestic cycle are smoothed by the intergenerational structure of complex households and extended kin groups. This amelioration may be retarded by competition between constituent units. Understanding the dynamics of the developmental cycle and micropolitics of domestic groups is a useful correction to Chayanov's widely used formulation, especially in developing countries where complex kin structures are common.

economy | household | peasants

The prominent theoretical model of the economics of peasant households is that advanced by A. V. Chayanov, in works from about 1910 to 1930, based on extensive survey data of Russian peasants (1, 2). He intended his theories to be applicable to cultivators who do not hire labor and are part of a partially monetized economy; thus, the theories should be relevant to most peasant cultivators since the dawn of civilization. A series of anthropological investigations and some theorizing show that his ideas are broadly useful even if not exhaustive. Nevertheless, his formulation is limited by a failure to incorporate domestic structures broader than the isolated nuclear family household. He admits their existence but denies their relevance. Nuclear households may have been sufficient to his political and macroeconomic goals but fail to reveal microeconomic dynamics important to the management of peasant life.

Chayanov's theorization and empirical research were designed to evaluate the nature of the peasant agricultural economy and the role of the peasant in the transition from feudalism to socialism, in the Russian political context after the revolutions of 1905 and 1917. The basic Marxist-theoretical question was whether peasants must pass through a capitalist stage or whether peasant agriculture was a stable system that could exist within socialism.[†] The basic question from neoclassical economic theory was Chayanov's formulation that peasant productivity was a function of the conflicting forces of the subjective marginal utility of labor and of the marginal disutility of effort. In operationalizing these concepts (ref. 1, pp. 70–89 and ref. 2, pp. 70–89), he scaled household members according to their participation as producers and/or consumers, using weightings by age and sex. He then compared the consumer/producer ratio (and other measures of household size and composition) with agricultural output and income. In his view, effort on the “family labor farm” was designed to satisfy a locally homogeneous acceptable standard of consumption; when that was achieved (at the intersection of the curves of marginal utility of labor and marginal disutility of effort), the “self-exploitation” of the peasant laborer ceased. Thus, peasants worked no harder than they had to and stopped when consumption demand was satisfied. They neither saved nor invested. Chayanov's efforts were part of a broad effort over time and in many countries to modernize, rationalize, and incorporate traditional peasant agriculture into a national economy as different regions began to industrialize and to increase agricultural output so that peasant

agriculture could feed the growing industrial workforce. That effort continues today, and his ideas are still relevant.

Criticisms of Chayanov's work and that of his commentators are of several kinds. The Marxist criticism is that he considered the peasantry to be locally homogeneous and ignored the importance of class differences among them, both with respect to the local consumption standard and to factors like differential child mortality (3–5). More technical arguments focus on whether he or some of his commentators interpreted the numbers, ratio, and balance of consumers and producers correctly, on whether the formulations can be extended to other kinds of economies (e.g., nonmonetized, strictly monetized), and on the degree to which the underlying statistical data are reliable. Extensive testing of Chayanov's ideas (6–11) lends general but not complete support, even though commentators differ among themselves.

Much of these debates focuses on a macrolevel issue: the role of peasants in the general economy or in economic history and the sources of differentiation of peasant households within a regional economy (demography for Chayanov, class for the Marxists). This article is not about those issues. Closer to its spirit is work in economic demography that examines the contributions of child labor to the family economy and effects on old age security and intergenerational transfers (12–15) or at what point peasants elect to stop working (6–8). This article is not about those issues, either. Rather, it is about other implications of Chayanov's theory and a deep insight of his that have been neglected in the anthropological literature and that he himself did not pursue.

Chayanov's unpursued insight is that each household can be expected to move across levels of well-being, governed by the number of its producers and consumers (all else being equal), as it progresses through the domestic cycle. He thus anticipated the work of Fortes (16) and Goody (17) in recognizing the dynamic quality of the cycle of domestic groups. Indeed, the changes in well-being predicted by Chayanov can be seen as an important driving force in the domestic cycle itself, if pursued beyond the individual conjugal unit.

In this article, anthropological terms have the following definitions: conjugal, husband and wife; nuclear family, conjugal (or its remnants) plus any children; consanguineal, related by blood; affinal, related by marriage; agnatic, related only through male consanguineal links; lineal, consanguineally related by ascent or descent; collateral, consanguineally related through a sibling link at any generational level; patrilineal, bride joins

Abbreviation: C/P, consumer/producer.

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[†]Chayanov's position was the latter, closer to Bukharin's, and contradicted Lenin's, for which difference of opinion he ultimately paid with his life. Chayanov was arrested July 21, 1930 and incarcerated in the Butyrka prison for 4 years, then banished to Alma-Ata in Kazakhstan. He continued to write on the peasant economy. He was sentenced to be shot on October 3, 1937, and the sentence was carried out the same day. He died at the age of 49.

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household of husband's father; polygamy, marriage with multiple wives; corporate, having a unitary nature.

My attempt to broaden Chayanov's work has three parts. He limited his explicit model of peasant households to nuclear family households, on the grounds that complex families were a thing of the past (ref. 2, pp. 54 and 56). Nevertheless, it is clear from his own and other data that patrilivirilocal residence was common and that patrilineally extended if not fraternal joint families occurred (ref. 2, pp. 54, 56, 59, and 60). His work would be more broadly useful if it included consanguineally extended households and kin groups or even affinally extended ones, such as polygamous units, or affinal exchange systems. All of these are common in many contemporary world areas outside Europe and the Americas, and historically even within Europe, Japan, China, and other regions (ref. 2, p. 54, note 1). Some analyses (e.g., ref. 15) note the possibility of extended intergenerational transfers; the focus here is on collateral rather than lineal relationships.

Chayanov limited the span of the developmental cycle of the household to 26 years (ref. 2, p. 57). This span is too short for a population in which complex households were expectable and in which collateral ties between households were important.

He considered the household as a firm without internal contradictions, ignoring differences in status and power within it. These factors are especially important in complex households with potentially competing rather than fully cooperating subunits. The importance of this factor became clear in recent work on maternal mortality in the historical Balkans, in which it emerged that the size and composition of the husband's agnatic kin group and a woman's social rank within it played a major role in the risk of death in childbirth (18).

Chayanov considered households as autarkic units, isolated except for their articulation with the monetized regional economy. Thus, he ignored frequently reported mechanisms of interhousehold exchange of labor, even if not of goods (refs. 19 and 20, among others).

It is important to note that these criticisms apply to Chayanov's formal model, not necessarily to his sometimes discursive verbal commentary, especially when he defends himself against his critics. I propose to embed the corrections in the formal model itself.

A simple exploration of Chayanovian process across successive generations of patrilivirilocal residence can be shown with a nonstochastic model with enough population growth to achieve household complexity, with productivity and consumption scaled by age and sex. Although motivated by it, this model does not focus on the marginal utility and disutility of labor; rather it focuses on the consumer/producer (C/P) ratio generated over time in the developmental cycle. One version of the model specifies no intrahousehold or intranetwork competition (rivalry). The other includes increasing political strain and privatization of production by conjugal subunits in the interests of their own children. This kind of sequestering of output is typical where subunits seek to accumulate resources in anticipation of eventual fission. It is also facilitated by increasing monetization of the economy, because it is easier to sequester cash than most other goods. One might conceptualize such internal rivalry as a "rotten daughter-in-law" theorem, with dissension controlled by the household matriarch (the daughter-in-law's husband's mother) or by the ideal solidarity of brothers, but with diminishing efficacy over time (see ref. 21).

Table 1 shows the schedules of production and consumption by age and sex that apply in the model here presented (H), as well as the weights Chayanov used in his own explication (C). For example, in the H schedule, a male under 2 produces nothing and consumes a tenth of a unit, whereas a male aged 16–50 produces one unit and consumes one unit. A female in that age range produces 0.8 units and consumes 0.8 units. Females under age 15 are more productive than males under age 15. The values in H

Table 1. Schedules of production and consumption

Weights	Production				Consumption			
	Male		Female		Male		Female	
	Age	Units	Age	Units	Age	Units	Age	Units
Chayanov (C)	—	—	—	—	2	0	2	0
	—	—	—	—	3	0.1	3	0.1
	—	—	—	—	9	0.3	9	0.3
	15	0	15	0	15	0.5	15	0.5
	20	0.7	20	0.7	20	0.7	20	0.7
	50	1	45	0.8	51	1	46	0.8
This model (H)	5	0	5	0.0	2	0.1	2	0.1
	7	0.1	6	0.2	5	0.3	5	0.3
	9	0.2	10	0.5	9	0.5	6	0.5
	12	0.5	15	0.7	12	0.7	10	0.7
	15	0.9	20	0.7	15	0.8	12	0.8
	50	1.0	60	0.8	50	1.0	60	0.8
	100	0.8	100	0.7	100	0.8	100	0.7

are derived from those used by Chayanov (C) but differentiate more finely by sex and age and in particular gradually phase in child productivity earlier than Chayanov's absolute threshold of 15. These values seem ethnographically more realistic, at least for peasants, and for young females in general. The C model truncates at the ages shown (ref. 1, pp. 90, 218, and 219; ref. 2, pp. 57 and 58).

The weights are applied without change in the noncompetitive variant of the H model. In the competitive version, the productivity of a son's wife is a function of the number of her children, reflecting an assumed tendency to sequester output as her own family grows. Where P_{sw} is the productivity of a son's wife, P_{fx} is the base productivity of a woman of the same age, x , and c is the number of her children, then $P_{sw} = P_{fx}/(1 + c)$. Elaborations could include dependency on age and sex of children, nonlinearities, etc., but this simplistic adjustment is sufficient to generate a visible and plausible difference between the noncompetitive and competitive variants. (The same effects can of course be generated by modifying the productivity of the son or of the conjugal pair jointly; the device used was for computational convenience.)

In the C model, men marry at age 25, women at 20, and women bear nine children, starting in year 2 of the marriage and spaced 3 years apart thereafter. This schedule implies a somewhat unrealistic growth rate of $\approx 4.6\%$. Children are not distinguished by sex. The model is truncated at year 26. In the H model, men marry at 22, women at 20, men and women die at 60 (but not before), and wives bear four children, spaced two years apart, alternating males and females. This schedule implies a growth rate of $\approx 2.9\%$. Other schedules are of course possible; any reasonable schedule will produce the same main results described below.

Fig. 1 shows the C/P ratios produced by the noncompetitive and competitive H models and by the C model. Over the first 10–15 years of the history of a household, all models show an increase in the C/P ratio, as children are born to the two adult producers. The increase is greater in the C model and has an almost identical slope to that of the H model, but lasts longer, because the C model has higher fertility and greater birth spacing. The C/P ratio begins to decline as children become productive. The decline is deeper in the H model, because children are more productive sooner and appear earlier in the marriage. The optimal points for a household in the first cycle are at the beginning and about year 18–20 in the H model and year 25 in the C model. Chayanov's model stops at that point. His nuclear households dissolve and start anew.



Fig. 1 also shows the results of the noncompetitive H model continued past the first domestic cycle. The C/P ratio falls as a daughter-in-law enters and rises as a daughter leaves. This change happens twice, because there are two sons and two daughters. The ratio then begins to rise as children are born, then falls as children become productive, as in the first cycle. This same cycle repeats one more time in this three-cycle model. Note, however, that the peaks of the C/P ratio are damped in successive cycles. In part, this damping is because the household structure becomes generationally top-heavy. In the first cycle, there are two adults and four children. In the second, while those adults are still alive, there are six adults and eight children, yielding an improvement in the C/P ratio. Further, there is some scattering of events over time, even in this mechanical model,[‡] which further damps swings of the C/P ratio; that damping would be stronger if the model were stochastic. This scattering would

Nevertheless there are strains within such households, some of them intrinsic to the household demographic cycle itself. The option of fission is always available and often taken, all at once or one or more subunits at a time. These kinds of strains may increase as the children of some subunits approach full adult productivity, so that their subunits are on the verge of a quite favorable C/P ratio. Situations like this are particularly likely if the overall C/P ratio is unfavorable and concentrated in only one or a few of the subunits. For example, one brother may have many children who are immature, whereas another brother may have only a few children, but approaching maturity. It is noteworthy that, whereas household complexity smoothes the C/P ratio over time and thus smoothes fluctuations in the demand for labor and of microeconomic crisis, internal competition not only reduces this beneficial effect but becomes relatively more destructive over time as household complexity increases. Both the difference between and the ratio of the C/P ratios for the competitive and noncompetitive models become more extreme with time. In a sense, the complex household, although offering

*For example, in this model, brothers are 4 years apart in age. The entry of their wives into the household will be separated by 4 years. Their sons are separated by 4 years. The oldest son of the oldest brother is separated from the youngest son of the youngest brother by 8 years. The wives of those cousins will enter the household over an 8-year span. In the next generation, the span will be 16 years.

advantages over the nuclear, contains the seeds of its own destruction. Other issues may also stimulate fission, such as crowded housing conditions or insufficiency of exploitable resources such as farmland or pasture. Unequal inheritance provisions (e.g., customary ultimogeniture, primogeniture) may of course set the scenario for household division if non-heirs depart [as in much of historical Britain or with the *hidalgos* (“*hijos de algo*,” or roughly, “somebody’s children”) of Spain].

There are numerous examples of these factors in the ethnographic literature, especially in that of Africa, the Near East, Central and South Asia, and the Balkans. In my own fieldwork in the Balkans (24), peasants made it clear that they had preferred large, joint households and regarded them as wealthier. They spoke in detail about the strains between constituent units, which they regarded as caused by the wives of otherwise solidary brothers. They described how newly married couples might use temporary quarters in mild seasons in outbuildings constructed for their use, so that serious crowding and dissension (not to mention loss of personal privacy) in the main house were limited to the winters. They spoke in detail about the rules and working out of household division under the supervision of a disinterested maternal relative, and also how cooperation could be continued even after fission. All of this discourse is commensurate with the “competition” model, both before and after division.

Chayanov’s insight into the relationship between the demography and microeconomics of households can be deepened by broadening its scope beyond the decision about how much to work. This broadening may not help much in understanding the role of peasants in a regional market economy or as a stage on the road to socialism. It does help to understand what actors may actually do. Some of their actions may be “Malthusian”; that is, they may act directly to make the C/P ratio more favorable, through abortion or infanticide or adoption and fostering between kin and neighbors. Some of their actions may be “Boserupian”; that is, they may manipulate the social technology of the household economy by merging, dividing, and exchanging labor

and goods. The smoothing that is evident over time within the complex household has an analogy in smoothing across space between contemporary units of more distant kin connection or even only of propinquity. All of these techniques are well attested in the ethnographic and historical literature.

Chayanov’s already useful formulation is sharpened by being more realistic about cooperative and competitive behavior among kin who share a corporate estate. Maintenance of a successful social unit is an outcome of conflicting forces: the balance between producers and consumers, the degree of cooperation between producers, the emergence of divisive self-interest, all encompassed by cultural notions of what is right and proper behavior between kin. Our view of the conduct of economic and social life among primary producers would be clearer if observations could include the broader field of social action within which actors operate, not limiting it to the conjugal couple and its immediate quarters. In general, lifting the focus from the nuclear household reveals that more complex organization of households and of kin groups further smoothes production and consumption across the domestic cycle of the group and the life cycles of its members. Complex group organization accomplishes by sharing internally within autarkic units what exchange would accomplish between their subunits or more broadly between contemporary kin or neighbors regardless of co-residence. Because the productive capacities and consumption needs of domestic units are driven by the demography of the domestic cycle, social units based in kinship seem to be ideally larger rather than smaller, to the degree that size enhances the smoothing of supply and demand and that the micropolitics of internal competition permit.

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